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11.10. A Tangled Web Indeed: The Difficulty of Developing a Research Agenda for Distance Education

Editorial

Theory? Theory is one of those words like "ontological", "epistimology" and "dialectics"-it has never "unfolded" for me to reveal its hidden meanings and mysteries. "Hermanutics" has, thanks to the kind author who, at my request, bracketed (rules of thumb) for those of us who are semantically challenged. Of course, come dissertation proposal defense time, I was asked the predictable and, for me, almost incomprehensible question: "And just exactly what is the theoretical perspective underpinning your research?" I mumbled around for a while until a kind committee member rescued me with "Do you mean..." which actually turned out to be EXACTLY what I meant, even though the concept was slippery and made determined efforts to slither back into the darkness. That "theoretical" revelation sadly only opened one small, dissertation-sized window for me and the ray of light that entered was sharply focused and has failed to illuminate the fog beyond that one small circle.

And here comes Dr. Berge-someone for whom THEORY to undergird research holds no mysteries. He greets it with familiarity when it bounces off the page, waves a cheerful hand when it passes through his classroom, and has been known to spend hours in the library, deep in conversation with this mythical creature. The elaborate notion of a unifying theory of distance education is music to his ears and its absence sounds the discordant theme that accompanies the difficulties of constructing and prioritizing a research agenda to bring organization and sense field of distance education along.

I am in awe! Dr. Moore has commented on the need for synthesizing efforts that will bring together the scattered threads of distance education theory and start the weaving of a coherent whole. Dr. Berge has accepted his challenge to step back and examine the tangled mass of individual threads. Another of Dr. Berge's thoughtful and meticulous literature reviews will appear in the next edition of *The American Journal of Distance Education*. Don't miss it.

Mauri Collins

DEOSNEWS Editor

A Tangled Web Indeed: The Difficulty of Developing a Research Agenda for Distance Education

Zane L. Berge

For a discipline to be recognized as a serious field of study, a body of research involving its basic tenants, structures, and core domain of knowledge must be examined on a regular basis. "Research literature of a discipline shows the culture of the discipline ... the specialised knowledge and examples of research procedures that are unique to the discipline" (Mishra 1998, p. 267). Holmberg (1987), in summarizing early efforts in distance education research, stated that, while distance education was over 100 years old, research in distance education did not appear until after World War II. In fact, with few exceptions, the earliest research reports, articles, bibliographies, and monographs were published in the 1960s.

This article reviews the basic structure of distance education research as it currently exists in the literature. It also reviews the literature that has made recommendations for priorities to be set within distance education research. It is my contention here, however, that while there is a need to narrow or prioritize the most productive areas that should appear on a research agenda in distance education, the field remains too complex to gain consensus necessary for such a consistent or unifying framework to emerge.

Even though the field is relatively new, there have been several researchers who have outlined the basic structure of existing distance education research. Given this, scholars have called for a consistent, conceptual framework for research in distance education (Rekkedal 1994), as a basis for a "unifying theory" of distance education.

Basic Structure of Distance Education

In general, research agenda suggested by authors in distance education have been "laundry lists" of issues in the field (Calvert 1986; Calvert 1995; Cookson 1989; Faddah et al. 1998; Gupta and Renu 1986; Holmberg 1985; Holmberg 1986; Jegede 1994; Moore 1995; Muilenburg and Berge 2001; Omoregie 1997; Panda 1992; Perraton 2000; Phipps and Merisotis 1999; Rekkedal 1994; Schlosser and Anderson 1994; Scriven 1991; Sturrock and Howard 1989) (see **Table 1, attached,** for a summary). The sum of these comprehensive statements, while perhaps highlighting somewhat different issues, delineates the basic structure of the field.

Areas of Research Requiring Priority

Certainly, the comprehensive approach taken when stating the basic structure of distance education could be used to generate a lot of different researchable questions! But not all issues are of equal importance to furthering scholarship in the field. For instance, when talking about educational technology in general, Russell (1997) believed researchers should focus on five issues when exploring the unique qualities of specific technologies: cost, access, individual differences, productivity, and faculty resistance. Diaz (2000) pointed out that two experts in the field also suggest that the parameters of a research agenda for distance education should be limited and tightly focused:

"Saba (1998) and Ehrmann (1995) have suggested that many studies are simply asking the wrong research questions. Saba recommended that research hypotheses focus on whether educational strategies are successfully engaging students and on whether or not there is sufficient communication and interaction between instructor and student to promote the construction of knowledge" (Diaz 2000, n.p.)

Some authors (e.g., Phipps and Merisotis 1999) suggest that "filling the gaps" in the existing research should be the focus of research. This may be true if the gaps are filled by the answers to research questions that will make the greatest contribution to understand the breadth and extent of the field. Other authors suggest a very narrow focus (e.g., Eiserman and Williams 1987), while still other authors list very broad areas for recommended research (e.g., Moore 1985) (see **Table 2, attached,** for a summary). Distance education scholars have evidently not yet reached consensus regarding how to set the priorities for the distance education research agenda.

Methodology in Distance Education Research

Choosing the right research problem, research design, and suitable reporting venue are critically important, foundational issues for research in distance education (Coldeway 1990; Mishra 1998). A variety of research designs and methodologies are being used to explore and discover answers to research questions. Three-fourths of the research in distance education over the past decade has been descriptive of practices and outcomes (75.9%), as opposed to case studies (8.6%), correlational research (8.2%), or experimental research (7.3%) (Berge and Mrozowski, in press).

Because of the individual and insular nature of many of the existing research studies, even when it has been possible to provide a theoretical foundation, as expressed in hypotheses and the choices of research methods, most authors have not chosen to do so. Calvert (1990) stated, "pessimism has been the common conclusion of those who have written about the state of research in distance education" (p 155). There has been a shift from research that was based mainly on quantitative, experimental methods in the 1960s and early 1970s to qualitative, descriptive research in the 1970s and 1980s. This movement among research methodologies continues today and is likely to continue, well into the future. Some scholars have suggested a rather broad range of methodologies will be needed for future investigations to capture the accelerating extent of activity in the field (Lockee, Burton, and Cross 1999; Minnis 1985; Saba 2000; Saba and Twitchell 1988) (see **Table 3, attached,** for a summary).

Complexity

Distance education is a complex system (e.g., Calvert 1986; Garrison 2000; McIsaac and Gunawardena 1996). In the past, the approaches taken in distance education research were generally of three types: (1) that which relates to or was developed within other disciplines, (2) that which is specific to distance education, and (3) descriptive reports and studies. There is no question that education, in general, is a broadly multidisciplinary area of study, so it is not surprising to find that a significant amount of distance education research emerges from other disciplines.

Interdisciplinary Research

To witness the variety of disciplines represented in distance education research, one needs only to look at the different methods and the disciplines from which they have been developed: ethnography (anthropology), phenomenology (philosophy), heuristics (humanistic psychology), ethonomethodology (sociology), symbolic interactionism (social psychology), ecological psychology (ecology, psychology), systems theory (interdisciplinary), and hermeneutics (theology, philosophy, literary criticism) (Best and Kahn 1998, p. 245).

"Because the study of distance education is a multi-disciplinary enterprise, researchers with backgrounds in economics, business administration, psychology, sociology, geography and a variety of other disciplines may fruitfully apply their own perspectives to the outstanding questions. . . . Organising the distance education literature into a useful set of topics is a confusing task. Students demography, learning styles, tutorial systems and dropout, for example, may be treated as discrete topics, but they are also interrelated and may be dealt with in the same research paper" (Calvert 1986, p. 97).

Barriers Research

When the issues/problems/barriers to distance education are examined, you can see the complexity that emerges. For the past several years, Berge and colleagues (Berge 1998a; Berge 1998b; Berge and Mrozowski 1999; Berge and Muilenburg 2000; Muilenburg and Berge 2001a; Berge and Muilenburg 2001b) have been building a framework that should be useful to distance educators and scholars in several ways. But as usual, with activities as broad as distance education, it is difficult to develop one framework that is explanatory and predictive at all levels and all perspectives.

Table 4 (attached) describes the results of a factor analysis of barriers, the implementation of distance education that many stakeholders have discovered (Muilenburg and Berge 2001). Considering the key institutional support systems that must be used to overcome or reduce these barriers, at least a dozen or more significant systems that must be involved include:

- strategic planning
- organizational development
- faculty development
- educational technology
- technical training
- instructional systems development
- incentives structure
- legal department
- information technology
- library
- financial aid
- registrar

Table 5 (attached) matches some of the barriers to distance education to the key systems that must be brought into play to overcome them. Viewing distance education from the perspectives of three primary stakeholders-faculty, student, and management or administration-is both useful and instructive. Why? The barriers and issues perceived by these three groups are significantly different. Additionally, the relative priority given to the barriers by them is not the same, and these barriers vary according to the level of adoption of distance education and its centrality to the organization's mission. (For a more complete analysis, see Berge and Muilenburg 2001.)

Conclusions

Various research methods and theoretical approaches have been applied in distance education research. By far, the most common studies reported in the literature are atheoretical, comparative, descriptive, and evaluative studies of individual practitioners, courses or programs. The field of distance education research is still young and relatively immature. Some of the issues raised by critics of distance education research (e.g., Perraton 2000; Phipps and Merisotis 1999) are due to different philosophies and opinions about what constitutes "good" research methodology. There has been a shift from the quantitative, experimental methods in the 1960s and early 1970s to the qualitative research methods more popular in the 1970s and 1980s. In fairness, the qualitative research methods that have been developed recently have had positive effects on the distance education research agenda and engendered changes in the types of questions that are being explored (Rekkedal 1994).

The complex interdisciplinary nature of distance education is the reason it is both difficult to implement and sustain, and why it is difficult to develop a central, theoretical framework on which future distance education research can be based. Economists, business administrators, psychologists, sociologists, and a variety of others working from their own perspectives, in related disciplines, may successfully conduct research in distance education. Thus, organizing the literature in the field and making meaning of it is a difficult and confusing task. Consequently, there are many viable research paradigms that honor different ways of judging education research.

The search for a unifying theory of distance education persists. It is unlikely that one all-encompassing theory of distance education can be developed any more than one general, all-encompassing theory in education has emerged. Nor does there necessarily need to be one. While expanding the types of inquiry methods used in scholarship is healthy, research questions in distance education must still be prioritized. This cannot be a one-time event, but rather must be revisited frequently by a broad span of distance education scholars who continue to capture and investigate changes in this dynamic field.

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Table 1. Distance Education Research Basic Structure

Basic Structure

Calvert, J. (1986)	Calvert, J. (1995)	Cookson, P.S. (1989)
1) Learning at a Distance; 2) Students and Curricula; 3) Teachers at a Distance; 4) Institutional Policies and Structure; 5) Relationships Among Institutions; 6) Technology for Instruction; 7) Other Issues of Computer Technology; 8) Supplementary Support Services; 9) Economics.	1) Research and Theory; 2) Professional Education; 3) Educational Design; 4) Student Factors; 5) Gender; 6) Student Support; 7) Administration and Management; 8) Academic staff & Professional Development; 9) Technology; 10) Independence; 11) Collaboration and References to Location; 12) Evaluation; 13) Interaction; 14) Quality.	1) Research on Specific Education Methods; 2) Research on Student Outcomes; 3) Studies of Students' Response for Dropout; 4) Studies of Student Profiles; 5) Studies of Institutional Factors.

Basic Structure

Faddah, S.; Fike, D.; French, C; Fulcher, D; & Hsu, S.(1998)	Gupta, A. K. & Renu, A. (1986)	Holmberg, B. (1985)
1) Learners and Learning; 2) Faculty; 3) Administration and Organization Policy; 4) Technology and Instructional Design; 5) Learner Support. 6) Policy	DE Category 1) DE: Concepts, Principles and Perspectives; 2) DE in Indian States: Problems & Future; 3) DE in Universities: Open University; 4) DE in Different Developing Countries; 5) DE: Impact, Effectiveness and Research; 6) Mass Media and New Technologies in DE; 7) Course Materials in DE, Production, Training, etc.; 8) Student Assessment, Evaluation, Response Sheets, Support Services, Contact Programmes, Teaching/Learning Situations; 9) Enrollments and Dropouts in DE; 10) Management and Administration of DE; 11) DE and Rural / Technical/ Vocational/ Educational Professional Training.	1) Survey of DE and of research into DE; 2) The characteristics, rational and philosophy of DE, theoretical approach; 3) Application of Case Studies; 4) Course Development in General; 5) Curriculum and Objectives of Study; 6) Media; 7) Structure & Typography of Printed Courses; 8) Distant Students and Their Situation; 9) Organization and Administration; 10) Supervised Correspondence Study; 11) Two-way Communication; 12) Evaluation and Economics of DE; 13) History of DE; 14) Supervised Correspondence Study.

Basic Structure

Jegede O. (1994)	Moore, M.G. (1995) **(see end note for further details)**	Muilenburg, L.Y. and Berge, Z.L. (2001)
1) Theory and Philosophy; 2) Learner Characteristics; 3) Equity and Access; 4) Design and Development of Study Materials; 5) Instructional and Communication Technology; 6) Teleteaching and Learning; 7) Management and Planning; 8) Student Support Services; 9) Development of Students Study Skills; 10) Systems for the Provision of Feedback to Students; 11) Interactive Multimedia; 12) Discipline Based Context; 13) Cognition and Metacognition; 14) Cost Benefit Analysis; 15) Relationship Between Open Learning & DE; 16) Industrial and Business Training Context; 17) Research Methodology; 18) Evaluation; 19) Expert Learning Systems; 20) Role of DE in National Development; 21) Teacher Education; 22) Professional Development in DE.	1) Research on policy and administration; 2) Research on instruction; 3) Research on course design; 4) Research on learners and learning.	1) Administrative Structure 2) Organizational Change 3) Technical Expertise, Support, and Infrastructure 4) Social Interaction and Quality 5) Faculty compensation and time 6) Threatened by Technology 7) Legal Issues 8) Evaluation/Effectiveness 9) Access 10) Student Support Services

Basic Structure

Omoregie, M. (Jan. 1997)	Panda, S. (1992)	Perraton, H. (2000)
The Role of: 1) Learners; 2) Technology. 3) Faculty; 4) Administration;	1) Concept, Growth and Development; 1) Curriculum/Course Planning and Development; 2) Instruction/Teaching; 3) Media and Technology; 4) Learners and Learning; 5) Institutional Policy and Management; 6) Economics; 7) Evaluation/Programme Evaluation; 9) Staff Development.	1) Research and Theory; 2) Traditions of Educational Thinking; 3) About the Existing Research - Theory; 4) Research on Context as well as Application.

Basic Structure

Phipps, R. & Merisotis, J, (1999)	Rekkedal, T. (1994).	Schlosser, C.A. & Anderson, M.L. (1994)
1) The Effectiveness of Distance Learning; 2) Student Outcomes, i.e. Grades and Test Scores; 3) Student Attitudes about Learning Through DE; 4) Overall Student Satisfaction Toward Distance Learning.	1) Teaching in distance education and the development of teaching/learning material; 2) Surveys and description of student bodies, recruitment, dropout and completion; 3) Systems, Administration, Organization and Economy; 4) Student Support and Counseling; 5) Evaluation and Quality Development.	1) Philosophy and theory of DE; 2) Distance students, their milieu, conditions and study motivation; 3) Administration and organization; 4) Communication and interaction between students and their supporting organization; 5) Economics; 6) History of DE (Holmberg, 1987) 7) Systems (comparative DE, typologies, evaluation, etc.)

Basic Structure

Scriven, B. (1991)	Sturrock, J. & Howard, D.. (1989)
1) Specific Pprograms and Courses; 2) Course Design and Development; 3) Students and their Characteristics; 4) Tutors, Staff Development, Staff Involvement; 5) Telecommunications and Media; 1) Counseling and Student Support; 2) Economics and Management; 3) Specific Countries - Practices and Procedures; 4) Theory; 5) Unclassified.	1) Electronic Communication; 2) Evaluation of DE Programs and Materials; 3) Learner Independence; 4) Specific Programmes; 5) DE - Self Definition; 6) Innovations; 7) Counseling and Support Systems; 8) Reviews of the Literature.

Basic Structure --- (End Note)

Moore, M.G. (1995) Editorial, American Journal of Distance Education, 9.2., pp1-1

(India article - pgs. 278-279)

Based on the proceedings of "Distance Education Research Symposium: A Research Agenda"

1) Research on policy and administration:
   - The legitimacy of DE in professional lives of faculty and administrators and the attendant change process necessary to provide DE with "value added" for these professionals;
   - Finance and financial models-efficiency of investments in DE and its measurement;
   - Changing the faculty culture for encouraging their participation in DE;
   - Access, equity and social impact of programmes in relation to market driven approach, socio- economic impact and consumer protection policies;
   - Change models for applying research results to practice;
   - Effect of work styles and life styles on DE and vice-versa, for administrators and faculty;
   - Evaluation of administrative practices in relation to socio-political issues and question of relevance.
2) Research on instruction:
   - Is frequency of interaction meaningful?
   - Is understanding increased when interaction is present?
   - Is there an influence on learner satisfaction?
   - Is interaction more important for certain types of learners?
   - Is there an optimum form/type of interaction in particular settings?
   - What is the effect on retention?
   - Are there changing patterns/levels of interaction over a course?
   - What is the interplay between public and private interaction?
   - What is the interplay between types of interaction occurring simultaneously?
   - What do students like? Want? Need?
   - How is cost effectiveness and learning effectiveness determined?

Basic Structure --- (End Note continued)

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3) Research on course design:
   - Affective component in learning: recognizing that course design can be both affective and cognitive
   - Technology application in various designs
   - Educational designs from instruction point of view
   - Educational designs from the learners point of view, with reference to information overload,
   - Designing for collaborative learning;
   - Use of course design for learners to reflect
   - Factors influencing course design efficacy
   - Dimensions of learner-centered designs
   - Changes from linear to multivariate models of course designs;
4) Research on learners and learning:
   - Are we simply looking for a satisfied learner?
   - Are we looking at who can do well on a course test?
   - Are we starting to broaden our outlook and evaluate long-term, post-course results?
   - Are we looking at outcomes where students have gained cognitive skills or may have acquired a broader level of learning strategies that they did not have before?
   - How do we assess the kind of process that help students engage in "meaning making"?
   - How various media contribute to learner outcomes?
   - The extent to which research looks at learning in its total context.

Table 2. Distance Education Research Priorities

Priorities

Coldeway, D.O. (1990)	Cookson, P.S. (1989)	Eiserman, W.D., & Williams, D. (1987)
More basic research into human learning and motivation. Especially in the context of: 1) Adult development; 2) Individual study; 3) Learning from prose; 4) The effect of technology on human behavior; 5) The interaction between adult learning and adult lifestyle, is needed.	1) Adult learning process, Yet to be examined in detail is the nature of the adult learning process, which attend the generation of outcomes in DE.	1) Although studies report use of media in DE, very little information is provided about actual implementation of these media. 2) Focus of instruction, who is served and what content and instruction designs are used. 3) What judgments have been made about effectiveness?

Priorities

Jegede, O. (1994)	Holmberg, B. (1987)	Marland, P. (1989)
<u>However, areas attracting 70% and above requiring concentration of research efforts are:</u> 1) Learner characteristics; 2) Design and development of study material; 2) Instructional and communication technologies; 3) Student support services; 4) Development of students study skills; 5) Systems for the provision of feedback to students; 6) Evaluation.	1) In inductive research methods there is a great need for fact finding about international distance education. With reliable factual background in: a. value judgments, b. traditions, - practices to one another in a meaningful way.	<u>sets three pressing reasons why DE research should receive priority (p. 178):</u> 1) Distance learners constitute a sub-group of tertiary students whose instructional programmes and materials learning, contexts and problems differ markedly from those of their on-campus peers. Past experience has shown that it is imprudent to extrapolate from one setting to another. 2) Since the 1970s there has been a dramatic world-wide upswing in the numbers of distance learners and of institutions offering distance learning programmes 3) Very little research into distance teaching and learning has been conducted that provides a basis for the evaluation of traditional assumptions and practices in the design and conduct of distance education programmes. <u>identified main areas that invite research attention (p. 180</u> 1) the nature of students' espoused theories for learning from text including, for example, their goals, motives, beliefs, conceptions of learning and the learner's role, and study approaches 2) The nature of students' theories in-use when learning from text 3) Congruency (or lack of it) between espoused theory and theory-in-use. 4) Effects of contextual variables, such as study background, career and family commitments 5) effects of different textual formats on espoused and

		in-use theories and mediating processes 6) relationships between espoused and in-use theories and mediating processes on the one hand and learning outcomes on the other

Priorities

Moore, M.G. (1985	Panda, S. (1992)	Perraton, H. (2000)
Future research should focus on: 1) Theory 2) Method 3) Content	Research literature of DE in Indian context, listed five important broad research areas needing urgent attention: 1) Curriculum planning and development, and developing a comprehensive model, with room for variations, within a given socio-cultural set up; 2) Different modes of course development and testing their instructional components for wide implementation, including media-mix in different disciplines for optimum utilization of media within a given budget; 3) Instructional design-development-implementation, especially comparative studies on instructional strategies; 4) Studies on distance learners and how they learn; and **5) The approaches to co-ordination, information dissemination and exchange, and quality control within the process of DE objectives.**	Four propositions about the links between them, and follows them with four proposals about important areas of research: 2) Research and theory; 3) Traditions of educational thinking; 4) Existing research needs to be grounded in theory; 5) Research on context as well as application.

Priorities

Phipps, R. & Merisotis, J. (1999)	Rekkedal, T. (1993)	Rekkedal, T. (1994)
Gaps in research that require further investigation and information: 1) Research emphasize student outcomes for individual courses rather than for a total academic program; 2) Research does not take into account differences among students; 3) Research does not adequately explain why the drop-out rates of DL are higher; 4) Research does not take into consideration how the different learning styles of students relate to the use of particular technologies; 5) Research focuses mostly on the impact of individual technologies rather than on the interaction of multiple technologies; 6) Research does not include a theoretical or conceptual framework; 7) Research does not adequately address the effectiveness of digital libraries.	**Some of the areas in need of research mentioned at the Norwegian Conference:** - Theory studies with relevance for DE - National policies and effects on DE developments – and market research - Different organizational forms and forms of cooperation - Counseling and guidance - Studies of the educational process, learning media and two way communication - Teacher roles, interests and attitudes - Efficiency and effects studies - Different media, uses and applications - The students' actual use of different media and interaction possibilities - Intensive studies on methods of learning including direct observations	Challenges for future DE research and to some possible recommendations and actions. 1) As an applied profession field it needs both basic research which tests and develops knowledge to guide practice, and research to solve practical problems; 2) Probable that co-operation on research might give better results than individual institutions based projects; 3) Like to see further integration of research philosophies, methods and designs to take place; 4) Like to see practitioners be more involved in research, and apply research results to their practice; 5) A large need for research on how different students learn with different kinds of technology in different types of programs; 6) A need to develop a consistent conceptual framework for research in DE.

Priorities

Rockwell, S.K. (1999)	Scriven, B. (1991)	Taylor, J.C. (1989)
1) Evaluations needed for Planning Decisions; 2) Evaluations needed to Serve Structuring Decisions; 3) Assessments needed to Serve Decisions Relative to how Distance Education is being Implemented; 4) Evaluations needed to Serve Decisions Relative to Outcomes, or Impacts that Distance Education is having; 5) Research needed about Education in General.	Other topics which articles in the journal have not yet covered adequately or referred to only briefly: 1) Open learning and its relationship to DE; 2) DE at the primary, secondary and technical levels; 3) DE for training and professional development; 4) Measures of quality in DE; 5) Organization and administration of DE; 6) Co-operation and collaboration in DE.	With reference to South Asia listed six areas on which research in DE should be conducted: 1) Factors affecting learning process of distance students; 2) Effectiveness of instructional strategies; 3) Cost-effectiveness of combinations of instructional media; 4) Evaluation of usefulness of different DE techniques in formal and non-formal educational context; 5) Economic impact on DE and its role on national development; 6) Theoretical underpinning of DE.

Table 3. Distance Education Research Methodologies

Methodologies

Lockee, B., Burton, J., & Cross, L. (1999)	Minnis, J.R. (1985)
1) Aptitude-Treatment Interaction (ATI) studies; 2) Longitudinal studies; 3) Developmental studies; 4) Media attributes; 5) Instructional strategies; 6) Individual learner characteristics.	Recommends three methods as alternative research approaches designed to understand distance education phenomena to achieve the theoretical and conceptual depth of distance education: 1) Ethnography 2) Case study 3) Grounded theory

Methodologies

Saba, F. (2000)	Saba, F. & Twitchell, D. (1988)
In new lines of research, new methods are employed, which goes beyond the narrow confines of experimentation. The new methods cast a wider net for capturing the data generated by the interaction between the teacher and the learner in qualitative and quantitative forms. Uses of: 1) Student self-reporting through a survey study; 2) Extensive interviewing of students; 3) Conversation and discourse analysis;	Identified the use of different methods of enquiry: 3) Descriptive analysis used to show how DE systems are organized and governed; 4) Cost-benefit analysis is used to study financing and budgeting of systems; 3) Course evaluation methods are used to study curriculum effectiveness 4) Survey methods are used to study utilization patterns and user attitudes towards the system; 5) Experimental research methods are used to study learners and to measure learning outcomes.

Table 4: Factors in barriers to distance education.

1) Administrative Structure: Managing distance learning programs through the existing administrative structure can be problematic. Partnerships among different units within an organization or among different organizations require agreements on fiscal issues such as costs, tuition and fees, and distribution of revenue, as well as scheduling and issuance of credits.

2) Organizational Change: Organizations are resistant to change. Without a shared vision for distance learning, a strategic plan, and key players within the organization who are knowledgeable and supportive of distance learning, implementing a distance learning program is a slow and difficult process.

3) Technical Expertise, Support, and Infrastructure: It is difficult to keep up with the fast pace of technological change. Many instructors lack the knowledge and skills to design and teach distance learning courses, yet their organizations lack support staff to assist with technical problems, to develop distance learning course materials, or to provide distance learning training. The technology-enhanced classrooms or laboratories and the infrastructure required to use them may not be available.

4) Social Interaction and Quality: Participants in distance learning courses can feel isolated due to lack of person-to-person contact. But some people are uncomfortable with the use of student-centered and collaborative learning activities because they change the traditional social structure of the classroom. There are concerns about the quality distance learning courses, programs and student learning. Testing and assessment of student outcomes is also a concern.

5) Faculty compensation and time: As the saying goes… "Time is money." Distance learning courses require a greater time commitment, so faculty compensation, incentives and release time are important issues. Lack of grants to fund distance learning projects is also a problem.

6) Threatened by Technology: Some people fear that an increase in the use of distance learning technologies may decrease the need for teachers. Feeling intimidated by technology may also threaten an instructor's sense of competence or authority. Either or both of these psychological factors may lead a person to feel that their job security is threatened.

7) Legal Issues: The increasing use of particularly the Internet to deliver distance learning raises concerns about copyright, fair use policies, piracy, intellectual property rights, and problems with hackers and viruses.

8) Evaluation/Effectiveness: There is concern over a lack of research supporting the effectiveness of distance learning as well as a lack of effective evaluation methods for distance learning courses and programs. (The issue of accreditation for distance learning programs was also related to this factor, although it did not meet the cutoff of 0.30.)

9) Access: Many students lack access or there are concerns over equal access to courses offered via newer technologies such as Web-based instruction. Instructors also lack access to the necessary equipment and courses.

10) Student Support Services: Provision of student services such as advisement, library services, admissions and financial aid is a critical facet of any distance learning program. There are also concerns about how to monitor the identity of distance learning students.

Table 5. Barriers and key support systems.

Barrier	Help
Administrative Structure	Organizational Strategic Planning
Organizational Change	Organizational Development; Strategic Planning
Technical Expertise	Faculty Development; Educational Technology; Technical Training
Social Interaction and Quality	Instructional Systems Development
Faculty compensation and time	Incentives Structure
Threatened by Technology	Organizational Development
Legal Issues	Legal Department
Evaluation/Effectiveness	Instructional Systems Development
Access	Information Technology
Student Support Services	Student Support Services (IT; Library; Financial Aid; Registrar)